

## Claims

1. A method for identifying a compound that treats a neoplasia, said method comprising the steps of:

(a) contacting a cell comprising a mutation in a Class B synMuv gene selected from the group consisting of: *mep-1*, *lin(n3628)*, *lin(n4256)*, and *lin-65* and a second mutation in a synthetic multivulval gene, or an ortholog thereof, with a candidate compound;

(b) detecting a phenotypic alteration in said contacted cell relative to a control cell; wherein a candidate compound that alters the phenotype of said contacted cell relative to said control cell is a compound that treats a neoplasia.

10 2. The method of claim 1, wherein said cell is in a nematode.

15 3. The method of claim 1, wherein said cell is an isolated mammalian cell.

4. The method of claim 1, wherein said phenotypic alteration is a decrease in cell proliferation.

20 5. A method of identifying a nucleic acid target of class B synMuv biological activity, said method comprising:

(a) providing a microarray comprising fragments of nematode nucleic acids;

(b) contacting said microarray with detectably labeled nucleic acids derived from a nematode comprising a mutation in a Class B synMuv gene selected from the group consisting of: *mep-1*, *lin(n3628)*, *lin(n4256)*, and *lin-65* gene;

25 (c) detecting an alteration in the expression of at least one nucleic acid of a *C. elegans* comprising a mutation in said Class B synMuv gene relative to the expression of said nucleic acid in a control nematode, wherein an alteration in said expression identifies said nucleic acid as a nucleic acid target of class B synMuv biological activity.

6. The method of claim 5, wherein said *C. elegans* further comprises a mutation in a second synMuv gene.
7. The method of claim 5, wherein said *C. elegans* further comprises a mutation in a gene that results in a Vulvaless (Vul) phenotype.
8. A method for identifying a nucleic acid that binds a synMuv class B polypeptide, said method comprising:
- (a) providing nucleic acids derived from a nematode cell;
  - 10 (b) crosslinking said nucleic acids and their associated proteins to form a nucleic acid-protein complex;
  - (c) contacting said nucleic acid-protein complex with an antibody against a polypeptide selected from the group consisting of MEP-1, LIN(n3628), LIN(n4256), and LIN-65;
  - 15 (d) purifying said nucleic acid-protein complex using an immunological method; and
  - (e) isolating said nucleic acid, wherein said isolated nucleic acid is a nucleic acid that binds a synMuv class B polypeptide.
- 20 9. The method of claim 30, further comprising the following steps:
- (f) detectably labeling the nucleic acid of step (e);
  - (g) contacting a microarray comprising *C. elegans* nucleic acid fragments with said detectably labeled nucleic acid; and
  - (h) detecting binding of said detectably labeled nucleic acid, wherein said binding identifies said nucleic acid as a nucleic acid that binds a synMuv class B polypeptide.
- 25 10. A method for identifying a candidate compound that treats a neoplasia, said method comprising:

(a) providing a cell having a mutation in a nucleic acid encoding KIAA1732 and having a second mutation in a synMuv nucleic acid, or ortholog thereof;

(b) contacting said cell with a candidate compound; and

(c) detecting a decrease in proliferation of said cell contacted with said candidate compound relative to a control cell not contacted with said candidate compound, wherein a decrease in proliferation identifies said candidate compound as a candidate compound that treats a neoplasia.

11. The method of claim 10, wherein said cell is an isolated mammalian cell.

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12. A method for identifying a nucleic acid that binds KIAA1732, said method comprising:

(a) providing nucleic acids derived from a mammalian cell;

(b) crosslinking said nucleic acids and their associated proteins to form a nucleic acid-protein complex;

(c) contacting said nucleic acid-protein complex with an anti-KIAA1732 antibody;

(d) purifying said nucleic acid-protein complex using an immunological method; and

(e) isolating said nucleic acid, wherein said isolated nucleic acid is a nucleic acid that binds KIAA1732.

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13. The method of claim 12, further comprising the following steps:

(f) detectably labeling the nucleic acid of step (e);

(g) contacting a microarray comprising human nucleic acid fragments with said detectably labeled nucleic acid; and

(h) detecting binding of said detectably labeled nucleic acid, wherein said binding identifies said nucleic acid as a nucleic acid that binds KIAA1732.

14. A vector comprising a nucleic acid having at least 95% identity to (SEQ ID NO:30).

15. An isolated cell comprising the vector of claim '3.

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16. A method for identifying a compound that treats a neoplasia, said method comprising the steps of:

(a) contacting a nematode comprising a mutation in a Class C synMuv gene selected from the group consisting of *trr-1*, *hat-1*, *epc-1*, and *ssl-1* with a candidate compound; and

(b) detecting an altered phenotype in said contacted nematode relative to a control nematode; wherein a candidate compound that alters the phenotype of said contacted nematode relative to said control nematode is a compound that treats a neoplasia.

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17. A method of identifying a nucleic acid whose expression is modulated by a synMuv class C polypeptide, said method comprising:

(a) providing a microarray comprising fragments of nematode nucleic acids;

(b) contacting said microarray with detectably labeled nucleic acids derived from a nematode comprising a mutation in a Class C synMuv gene selected from the group consisting of *trr-1*, *hat-1*, *epc-1*, and *ssl-1* gene;

(c) detecting an alteration in the expression of at least one nucleic acid of a *C. elegans* comprising a mutation in said synMuv class C gene relative to the expression of said nucleic acid in a control nematode, wherein an alteration in said expression identifies said nucleic acid as a nucleic acid modulated by a synMuv class C polypeptide.

18. The method of claim 17, wherein said *C. elegans* further comprises a mutation in a gene that results in a Vulvaless (Vul) phenotype.

19. The method of claim 18, wherein said gene encodes LET-60.

20. A method for identifying a nucleic acid target of a synMuv class C polypeptide, said method comprising:

- 5 (a) providing nucleic acids derived from a nematode cell;
- (b) crosslinking said nucleic acids and their associated proteins to form a nucleic acid-protein complex;
- (c) contacting said nucleic acid-protein complex with an antibody that binds a polypeptide selected from the group consisting of TRR-1, HAT-1, EPC-1, AND SSL-1;
- 10 (d) purifying said nucleic acid-protein complex using an immunological method; and
- (e) isolating said nucleic acid, wherein said isolated nucleic acid is a nucleic acid that binds a synMuv class C polypeptide.

15 21. The method of claim 20, further comprising the following steps:

- (f) detectably labeling the nucleic acid of step (e);
- (g) contacting said detectably labeled nucleic acid with a microarray comprising *C. elegans* nucleic acid fragments; and
- (h) detecting binding of said detectably labeled nucleic acid, wherein said binding identifies said nucleic acid as a nucleic acid target of a synMuv class C polypeptide.